

FIGURE 6N

**LIPOPROTEIN (A)**

Retrospective studies of populations of people indicate that high levels of lipoprotein (A) is associated with increased risk of premature coronary artery disease. Currently only the drug Niacin is known to reduce lipoprotein levels. It is not known whether this reduction in lipoprotein (A) levels can decrease the instances of coronary artery disease.

Prospective clinical studies will be required.

## HOMOCYSTEINE

There are many risk factors influencing the development of atherosclerotic vascular disease. Another relatively, newly recognized risk factor for coronary disease is elevated blood levels of homocysteine. Homocysteine is an amino acid in the bloodstream. It has been known for years that there is a congenital disease resulting in extremely high levels of homocysteine. These people are known to be at a very high risk for coronary disease. More recently it has been recognized that even minor elevations of homocysteine may also increase one's risk of coronary artery disease. This is particularly so with patients who have other positive risk factors for developing this disease. A hypothesis is that homocysteine damages arterial walls making them more likely to become targets for the development of coronary artery disease.

There is one estimate that 20 million Americans have elevated levels of homocysteine. The good news is that there are ways to lower one's homocysteine levels. This involves the ingestion of folic acid, Vitamin B6 and B12. One way to accomplish this is by eating leafy green vegetables, fruits and legumes. Another very effective way is to eat a fortified cereal. In fact the only food that contains all three Vitamins is a ready to eat, fortified cereal.

What is folic acid? Folic acid is one of the B vitamins. It is found in green, leafy vegetables. A body uses folic acid to build new cells and repair damaged cells. In addition, it is also essential for construction by the body of DNA. The daily recommended value of folic acid is 400 micrograms. As mentioned above, green, leafy vegetables have large amounts of folic acid. Other sources include: nuts, legumes, certain fruits and grain foods.

If one wishes to obtain these Vitamins (folic acid, Vit B6, Vit B12) by eating vegetables, fruits and legumes, it is important to understand that prolonged heating or boiling of these substances or microwave heating may reduce levels of these Vitamins.

Individuals who ingest these three important Vitamins are usually well protected and therefore actually measuring blood levels is not required. A recently performed study published in the New England Journal of Medicine showed an average of 11% decrease in homocysteine levels with a 15 week course of eating  $\frac{3}{4}$  cups of Total cereal per day. It should be noted, however that there are no well controlled studies conclusively showing that decreasing homocysteine levels will result in a lower level of coronary artery disease. These types of studies are currently ongoing.

FIGURE 6P

## VITAMIN E AND OTHER ANTIOXIDANT VITAMINS MAY EFFECT CORONARY DISEASE

There is much evidence that cholesterol is a major component of atherosclerotic plaque build-up. Cholesterol is carried to the plaque in the form of LDL cholesterol. There is evidence that this cholesterol must first be oxidized before it actually enters the plaque and participates in plaque build-up. There is speculation that anti-oxidant vitamins such as Vitamin C, E and beta-carotene may prevent plaque formation by interfering with this oxidation. To put it another way, is it possible that anti-oxidant vitamins can prevent or reduce coronary artery disease.

The evidence for this is strongest for Vitamin E. There are some studies that suggest that Vitamin E taken in relatively large doses as a dietary supplement may function to inhibit the atherosclerotic process. It should be noted that one cannot get enough Vitamin E from normal dietary intake to be effective, therefore diet supplementation must be used. The evidence for Vitamin C and beta-carotene functioning in this mode is quite a bit less.

It should be noted that there are ongoing studies trying to establish whether anti-oxidant Vitamins, particularly Vitamin E, are in fact useful for decreasing coronary disease. There is conflicting data in the regard. It should also be noted that there have been no long-term studies showing the safety of taking Vitamin E in relatively large doses for long periods of time. Your healthcare professional could help with this.